This application claims priority based on provisional application 60/449,454 filed Jan. 29, 2003

TITLE OF THE INVENTION

Receptacle for storing audio-visual media cases.

FIELD OF THE INVENTION

[0001] The present invention relates to receptacles for storing audio-visual media cases. More specifically, the present invention is concerned with a receptacle that can engage another similar receptacle at an acute angle.

BACKGROUND OF THE INVENTION

[0002] Receptacles in the form of modular trays for storing audio-visual media cases come in a variety of forms. For example, U.S. Patent 5,191,983 issued on March 9, 1993 describes modular trays that can be directly stacked on top of each other. U.S. Patent 5,518,122 issued on May 21, 1996 and U.S. Patent 5,715,948 issued on February 10, 1998 describe modular trays that can be directly stacked on top of each other or connected to each other side-by-side.

[0003] However, the prior art receptacles can be attached to each other in only a limited number of ways. Accordingly, a storage unit formed by a plurality of such receptacles can only have a limited number of shapes, while a user of such receptacles may desire to assemble storage units having more complex shapes for aesthetic or other reasons.

[0004] Against this background, there exists a need in the industry to provide a novel receptacle for storing audio-visual cases.

OBJECTS OF THE INVENTION

[0005] An object of the present invention is therefore to provide an improved receptacle that can engage a further receptacle at an acute angle.

SUMMARY OF THE INVENTION

[0006] In a first broad aspect, the invention provides a receptacle for storing an article, and usable with a similar receptacle for forming a storage unit, including a base defining a top surface and a bottom surface, a substantially elongated rib extending substantially outwardly from the top surface and a substantially elongated groove provided on the bottom surface. The groove is configured and sized to releasably engage a rib of the similar receptacle. The groove is further oriented at an acute angle with respect to the rib.

[0007] In another broad aspect, the invention provides a storage unit including first and second receptacles. The first receptacle includes a first base defining a first top surface and a first bottom surface and a substantially elongated rib extending substantially outwardly from the first top surface. The second receptacle includes a second base defining a second top surface and a second bottom surface, the second base being substantially identical to the first base. The second receptacle further includes a substantially elongated groove provided on the bottom surface. The groove releasably engages the rib to connect the second receptacle to the first receptacle. The rib and the groove are oriented such that when the first and second receptacles are connected, the first base is oriented at an acute angle with respect to the second base.

[0008] In yet another broad aspect, the invention provides a receptacle for storing an article, the receptacle being usable with a similar receptacle for forming a storage unit. The receptacle includes a base defining a

top surface and a bottom surface, a substantially elongated male means provided on the top surface and a substantially elongated female means provided on the bottom surface. The male means is oriented at an acute angle with respect to the female means. The male means and the female means are configured and sized such that the receptacle and the similar receptacle are interlocked upon the insertion of the male means of the receptacle into a female means of the similar receptacle.

[0009] In yet another broad aspect, the invention provides a receptacle for storing an article, the receptacle being usable with a similar receptacle for forming a storage unit. The receptacle includes a base defining a top surface and a bottom surface, a storage bay defined at least in part by the base and configured and sized for receiving the article, a substantially elongated rib extending substantially outwardly from the top surface and a substantially elongated groove provided on the bottom surface. The groove is configured and sized to releasably engage a rib of the similar receptacle. The groove is oriented at an acute angle with respect to the rib.

[0010] In yet another broad aspect, the invention provides a receptacle for storing an article, the receptacle being usable with a similar receptacle for forming a storage unit. The receptacle includes a storage bay configured and sized to store the article, a bottom portion located below the storage bay and a top portion located above the storage bay. The bottom and top portions are configured and sized such that the bottom portion of the receptacle can releasably engage a top portion of the similar receptacle in at least five discrete coplanar orientations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] In the appended drawings:

[0012] Figure 1A is a top perspective view of an embodiment of a receptacle;

[0013] Figure 1B is a bottom perspective view of the receptacle of Figure 1A;

[0014] Figure 2 is a perspective view of a storage unit including the receptacle of Figure 1A;

[0015] Figure 3 is a perspective view of another storage unit including the receptacle of Figure 1A;

[0016] Figure 4 is a perspective view of a pivot module included in the storage units of Figures 2 and 3;

[0017] Figure 5A is a bottom plan view of two receptacles interlocked with an offset in one direction;

[0018] Figure 5B is a bottom plan view of two receptacles interlocked with an offset in two directions;

[0019] Figure 5C is a bottom plan view of two receptacles interlocked with aligned centers and oriented at an acute angle with respect to each other;

[0020] Figure 5D is a bottom plan view of two receptacles interlocked with offset centers and oriented at an acute angle with respect to each other;

[0021] Figure 5E is a bottom plan view of three receptacles interlocked; and

[0022] Figure 5F is a bottom plan view of three receptacles interlocked with an offset.

DETAILED DESCRIPTION

[0023] Figures 1A and 1B illustrate a receptacle 2 for storing an article. The receptacle 2 includes a base 4 defining a top surface 6 and a bottom surface 8. The receptacle 2 further includes a storage bay 9, which will be described in more details hereinbelow. Two springs 11 and 13 are provided in the storage bay 9. A plurality of substantially elongated ribs, hereinbelow referred to collectively by the reference numeral 10, extend substantially outwardly from the top surface 6 and a plurality of substantially elongated grooves, hereinbelow referred to collectively by the reference numeral 12 are provided on the bottom surface 8. A groove, for example groove 12_9 is configured and sized to releasably engage a rib, for example rib 10_1, of another receptacle 2, the groove 12_9 being oriented at an acute angle with respect to the rib 10_1. In a specific example of implementation, the groove 12_9 is configured and sized to releasably interlock with the rib 10_1. The reader skilled in the art will appreciate that although the receptacle 2 includes a plurality of grooves 12 and a plurality of ribs 10, an embodiment including a single groove and a single rib is within the scope of the invention as defined in the claims recited hereinbelow.

[0024] In the specific embodiment illustrated on Figures 1A and 1B, some of the grooves 12, such as groove 12_3, are configured and sized to releasably engage the ribs 10 of another receptacle, while some other grooves 12, such as groove 12_4, are configured and sized to releasably engage

simultaneously a rib 10 of a first other receptacle and a rib 10 of a second other said receptacle. The engagement of ribs and grooves to one or more other receptacles will be described in further details herein below.

[0025] In other words, receptacle 2 includes the base 4, male means in the form of ribs 10 and female means in the form of grooves 12, the male and female means being configured and sized such that two receptacles 2 can be interlocked upon the insertion the male means of a first receptacle 2 into the female means of the second receptacle 2. One male means is oriented at an acute angle with respect to one female means.

[0026] Grooves 12 and ribs 10 may assume diverse configurations to allow receptacles to be connected in a variety of orientations. For example, in receptacle 2, groove 12_3 is parallel to rib 10_1, while groove 12_4 is perpendicular to rib 10_1. Consequently, groove 12_3 is perpendicular to groove 12_4. In addition, groove 12_1 is oriented at an acute angle with respect to grooves 12_3 and 12_4. In receptacle 2, the acute angle is 45 degrees, but other angles are possible without detracting from the claimed invention. Finally, two grooves, for example grooves 12_3 and 12_5 can be parallel.

[0027] In summary, the receptacle 2 for storing an article includes a storage bay 9 configured and sized to store the article, a bottom portion located below the storage bay and a top portion located above the storage bay. The bottom portion includes the grooves 12 and the top portion includes the ribs 10. The bottom and top portions are configured and sized such that the bottom portion of a first receptacle can releasably engage the top portion of a second receptacle in at least five discrete coplanar orientations.

[0028] As can be seen from Figure 1B, the grooves 12 define a plurality of substantially straight channels, each channel including at least two

collinear grooves 12. For example, grooves 12_4, 12_5, 12_6,and 12_7 are collinear and therefore define a channel 14_1.

[0029] The grooves 12 define channels that can be parallel but non-collinear, perpendicular or oriented at an acute angle with respect to each other. For example, a channel including grooves 12_1, 12_8, 12_{10}, 12_{11}, 12_{12} and 12_{13}, channel 14_2 is at an acute angle, here 45 degrees, with respect to the channel 14_1. In addition, channels 14_1 and 14_2 intersect at the location designated by the reference numeral 16. The channels define an interconnected network of channels.

[0030] The network of channels may include a first sub-network of channels arranged in a grid configuration. For example, all the channels of receptacle 2 which are either parallel or perpendicular to the rib 10_1 constitute such a first sub-network of channels. In addition, the network of channels may include a second sub-network of channels arranged in a grid configuration. In the receptacle 2, all channels which are angled at 45 degrees with respect to rib 10_1 constitute an example of such a second sub-network of channels. In receptacle 2, while not an essential characteristic, the first and second sub-networks of channels are angled with respect to each other at an angle of 45 degrees and have coincident centers at the location identified by the reference numeral 16.

[0031] The network of channels is defined by a plurality of substantially polygonal projections, referred-to collectively by the reference numeral 18, projecting outwardly from the bottom surface 8. The projections 18 can take, among other shapes, the form of a substantially triangular projection 18_1 or of a substantially square projection 18_2. Although not shown in the drawings, substantially rectangular projections of projections having other shapes can also be provided on the bottom surface 8.

[0032] In receptacle 2, the projections 18 each include a plurality of straight walls connected by a plurality of arcs. For example, projection 18_1 includes three straight walls 20_1, 20_2 and 20_3 as well as three arcs 22_1, 22_2 and 22_3. The plurality of straight walls and arcs define a hollow. Optionally, a projection, such as projection 18_2, includes at least one reinforcing member 24_1 extending through a hollow.

[0033] Turning now to Figure 1A, the ribs 10 of receptacle 2 define a first side wall 26_1, a second side wall 26_2 and a back wall 26_3 connected to the first and second side walls 26_1 and 26_2. The base 4, the first side wall 26_1, the second side wall 26_2 and the back wall 26_3 can define a storage bay.

[0034] Optionally, as shown on Fig 1A, ribs 10 of receptacle 2 further define first and second front sub-walls 26_4 and 26_5 respectively connected to the first and second side walls 26_1 and 26_2. The first and second front sub-walls 26_4 and 26_5 define a front opening 28. Also, receptacle 2 includes optional first and second interior walls 26_6 and 26_7 projecting from the base 4. The first and second interior walls 26_6 and 26_7 are substantially parallel to respectively the first and second walls 26_1 and 26_2. Also, the first and second interior walls 26_6 and 26_7 are connected respectively to the first and second front sub-walls 26_4 and 26_5 and to the first and second side walls 26_1 and 26_2. When, the first and second interior walls 26_6 and 26_7 are present they define the storage bay 9 for storing the article, along with the back wall 26_3 and the base 4. IN receptacle 2, the storage bay 9 is configured and sized to accept either a Compact Disc (CD) case or a Digital Video Disk (DVD) case.

[0035] The first and second side walls 26_1 and 26_2, the back wall 26_3 and the first and second front sub-walls 26_4 and 26_5 all have a common projection height outward of base 4, hereinafter referred to as a first projection height. In addition, the first and second interior walls 26_6 and 26_7 have a

common projection height outward of base 4, hereinafter referred to as a second projection height. In a specific example of implementation, the first and second projection heights differ by an amount equivalent to a depth of the grooves 12, the second projection height being smaller than the first projection height.

[0036] The receptacle 2 further includes a protuberance 30 projecting outwardly from the base 4 into the opening 28. The protuberance projects from the base 4 at a third height, the third height being smaller than the first and second heights.

[0037] In receptacle 2, the base 4 takes the form of a substantially plane and square plate, although other forms of the base, such as a rectangular plane base, among others, are within the scope of the claimed invention. Also, springs 11 and 13 each take the form of a resilient member connected to the back wall 26_3. The springs 11 and 13 each have a substantially uniform cross-section in a plane parallel to the base 4. Below each spring 11 and 13, the base 4 includes first and second narrow openings 32 and 34 substantially shaped as the cross-sections of the first and second springs 11 and 13 and located therebelow.

[0038] The receptacle 2 is integrally molded with a polymer. Therefore, the openings 32 and 34 can allow springs 11 and 13 to be detached from the base 4 during the molding process.

[0039] When an article is inserted in storage bay 9 through the front opening 28, springs 11 and 13 are depressed. Past a certain insertion point, the article abuts on the protuberance 30 and is maintained in position through cooperation between the springs 11 and 13 and the protuberance 30. When a user desires access to the article, he can remove the article from the receptacle

2 by lifting slightly the article above the protuberance 30, thereby allowing the springs 11 and 13 to push at least partially the article outside of the storage bay 9.

[0040] Two or more receptacles 2 are interlocked to form a storage unit. Examples of two storage units 36 and 38 are presented respectively on Figures 2 and 3. Storage units 36 and 38 each include a plurality of receptacles 2, a pivot module 40 and a top module 42

[0041] As shown on Figure 4, the pivot module includes an upper part 48 and a lower part 50. The upper part 48 is rotatably connected to the lower part 50. Such connections being well known in the art, they will not be described in further details herein below.

[0042] The lower portion 50 is provided with elongated grooves 12 configured and sized similarly to the grooves 12 of the receptacle 2. Also, the upper portion 48 is provided with elongated ribs 10 configured and sized similarly to the ribs 10 of receptacle 2. Therefore, the pivot module 40 can be locked to receptacles 2 in a way very similar to the way receptacles 2 are interlocked.

[0043] The top module 42 includes a substantially flat portion provided with a plurality of grooves 12 adapted to interlock at least one rib 10 of a receptacle 2. The grooves 12 are provided on a bottom surface of the top module 42 and are identical to grooves 12 of the receptacle 2. In addition, the top module 42 includes a substantially hemispheric portion 44 provided with a plurality of indentations 46 configured and sized to receive an article such as the article 47 stored in a receptacle 2.

[0044] In storage units 36 and 38, the grooves 12 and ribs 10 of receptacles 2, pivot module 40 and top module 42are configured and sized to such that some of the grooves 12 can releasably interlock with one of the ribs 10 of another receptacle 2 or pivot module 40. In addition, some of the grooves 12 of all these modules and receptacles can releasably interlock simultaneously with two ribs 10 of respectively two receptacles 2. Ribs and grooves interlock through friction.

[0045] As can be seen in Figures 2 and 3, receptacles 2, top modules 40 and pivot modules 42 can interlock in a variety of different ways. While these different ways relate to receptacles 2, top modules 40 and pivot modules 42, the following discussion will concentrate on the interlocking of receptacles 2 for clarity reasons.

[0046] Receptacles 2 can interlock with many relative offsets and angular positions. Figure 5A shows a bottom plan view of a receptacle 50 interlocked with a receptacle 52, both identical to receptacle 2. Some of the grooves 12 of receptacle 50 engage the rib 10_2 of receptacle 52 such that receptacles 50 and 52 are similarly oriented and offset in a single direction. In other words, the bases 4 of receptacles 50 and 52 are aligned on two edges an offset on two other edges. Similarly, Figure 5B shows a bottom plan view of receptacles 50 and 52 interlocked such that some of the grooves 12 of receptacle 50 engage the ribs 10_1 and 10_3 of receptacle 52 such that receptacles 50 and 52 are similarly oriented and offset in a two directions. In other words, the bases 4 of receptacles 50 and 52 have no aligned edges. In addition, although not shown in details in the drawings, receptacles 50 and 52 can be similarly oriented and aligned with no offset.

[0047] Figures 5C and 5D illustrate how receptacles 50 and 52 can be interlocked at an acute angle with respect to each other, either with no

offset, or with an offset. In addition receptacles 50 and 52 could be interlocked at a 90 or 180 degrees angles, with or without offset (not shown in details in the drawings).

[0048] Figures 5E and 5F illustrate three interlocked receptacles 50, 52 and 54. Groove 12 of receptacle 50 interlock simultaneously with rib 10,1 of receptacle 52 and rib 10,2 of receptacle 54. On Figure 5E, there is no offset of combined receptacles 52 and 54 with respect to receptacle 50, while there is such an offset on Figure 5F.

[0049] Many alternative embodiments of the present invention are possible. For example, front sub-walls 26_4 and 26_5 need not be present. Also, the springs 11 and 13 can take alternative forms.

[0050] Although the present invention has been described hereinabove by way of preferred embodiments thereof, it can be modified, without departing from the spirit and nature of the subject invention as defined in the appended claims.